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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/728,295	12/04/2003	Mohamed Y. Soliman	2003-IP-011150U1	7913

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EXAMINER

GEBRESILASSIE, KIBROM K

ART UNIT	PAPER NUMBER
2128	

DATE MAILED: 07/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/728,295

Applicant(s)

SOLIMAN ET AL.

Examiner

Kibrom K. Gebresilassie

Art Unit

2128

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 December 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>06/06/05&amp;12/04/03</u> . | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. This action is responsive to the amended application filed on December 04, 2003.
2. Claims 1-29 have examined.

### ***Information Disclosure Statement***

3. The information disclosure statements (IDS) submitted on December 04, 2003 and June 06, 2005 are being considered.

### ***Oath/Declaration***

4. The Office acknowledges receipt of properly signed oath/declaration filed March 25, 2004.

### ***Drawings***

5. Figures 1 and 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

6. The disclosure is objected to because of the following informalities:

- i. Page 20, line 14, the word "fractruess" is misspelled. The examiner interprets as "fractures".
- ii. Page 24, lines 6 and 7, the word "determinines" is misspelled. The examiner interprets as "determines".

Appropriate correction is required.

### ***Claim Objections***

7. Applicant is advised that should claim 1 be found allowable, claims 18 and 24 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

### ***Claim Rejections - 35 USC § 101***

8. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

9. Claim 1-29 are rejected under 35 U.S.C. 101 because the claimed invention is drawn to non-statutory subject matter.

Per independent claim 1, 18, and 24: The Examiner first submits that, in view of the language of the claims, method claim 1, 18, and 24 are abstract and do not appear to recite a tangible result. In this case the result appears to merely be an abstract set of system elements that are not used to achieve the application recited in the preamble of

the claim. The examiner submits that in order to establish a practical application, there must be either a physical transformation, or a useful, concrete and tangible result. Data transformation is not the same as a physical transformation. In this instance, it does not appear to be a tangible result. Here, the recited system elements simply result in determination, and are not a physical transformation. The claimed elements in this case, are simply a thought or computation element, and not in themselves a tangible result. It is not until the transformation applied in a meaningful way that it has real world value and becomes a tangible result.

***Claim Rejections - 35 USC § 102***

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claims 1-29 are rejected under 35 U.S.C. 102(b) as being anticipated by M.Y. Sollman, J. L. Hunt, and A. M. Elrabaa, "Fracturing Aspects of Horizontal wells", herein referred as Sollman, 1990 Society of Petroleum Engineers, pages 966-973.

**As per Claim 1:**

Sollman discloses a method of optimizing a number, placement and size of fractures in a subterranean formation (page 966, Summary) comprising the steps of: (a) determining one or more geomechanical stresses induced by each fracture based on the dimensions and location of each fracture (page 966, right side column, "stress Magnitude and Orientation" and page 967, left side column, "Determining Magnitude

Art Unit: 2128

and Orientation of Least Principal stress"); (b) determining a geomechanical maximum number of fractures based on the geomechanical stresses induced by each of the fractures (page 968, right side column, "Determining the Optimum Number of Fractures"); and (c) determining a predicted stress field based on the geomechanical stresses induced by each fracture (page 967, left side column, "Determining Magnitude and Orientation of Least Principal Stress").

**As per Claim 2:**

Sollman discloses the method according to claim 1, wherein steps (a), (b), and (c) are performed prior to creating any of the fractures in the subterranean formation (page 967, right side column, lines 4-6).

**As per Claim 3:**

Sollman discloses the method according to claim 1, further comprising the steps of: determining a cost-effective number of fractures (page 970, left side column, lines 13-17); determining an optimum number of fractures, where the optimum number of fractures is the maximum cost-effective number of fractures that does not exceed the geomechanical maximum number of fractures (page 968, right side column, "Determining the Optimum Number of Fractures").

**As per Claim 4:**

Sollman discloses the method according to claim 1, further comprising the step of spacing the fractures a uniform distance from each other (page 969, left side column, lines 3-5).

**As per Claim 5:**

Sollman discloses the method according to claim 1, further comprising the step of creating the fractures with a uniform size (page 971, left side column, lines 5-7).

**As per Claim 6:**

Sollman discloses the method according to claim 1, further comprising the steps of: creating one or more fractures in the subterrenan formation; and repeating steps (a), (b), and (c) after each fracture is created (page 971, left side column, "Conclusion" lines 1-3).

**As per Claim 7:**

Sollman discloses the method according to claim 6, wherein the repeating step comprises the steps of gathering and analyzing real-time fracturing data for each fracture created (page 967, left side column, under a title "Determining Magnitude and Orientation of Least Principal Stress" lines 19-25).

**As per Claim 8:**

Sollman discloses the method according to claim 7, wherein a well is placed in the subterrenan formation, the well comprising a wellhead, a tubing, and a well bore (Fig. 2), the well bore comprising a downhole section, and wherein the gathering of real-time fracturing data comprises the steps of: (i) measuring a fracturing pressure while creating a current fracture (page 970, right side column, lines 4-14); (ii) measuring a fracturing rate while creating the current fracture (page 969, middle column, lines 1-23; Fig. 13); and (iii) measuring a fracturing time while creating the current fracture (page 969, middle column, lines 9-13).

**As per Claim 9:**

Sollman fails expressly to disclose one or more transducers located at the wellhead. However, the limitation, one or more transducers, is deemed to be inherent to the teaching of Sollman as page 970 right side column, lines 4-14, which shows determination of pressure. The determination of pressure will be impossible if there is no any sensing device at the wellhead in the system of Sollman.

**As per Claim 10:**

Sollman fails expressly to disclose one or more transducers located at the wellhead. However, the limitation, one or more transducers, is deemed to be inherent to the teaching of Sollman as page 970 right side column, lines 4-14, which shows determination of pressure. The determination of pressure will be impossible if there is no any sensing device at the down hole in the system of Sollman.

**As per Claim 11:**

Sollman discloses the method according to claim 8, wherein the fracturing pressure is measured in the tubing (page 968, left side column, under a title "Effect of Fracture Conductivity" lines 5-21).

**As per Claim 12:**

Sollman discloses the method according to claim 7, wherein analyzing of real-time fracturing data comprises the steps of: determining a new stress field, based on the real-time fracturing data; and comparing the new stress field with the predicted stress field (page 967, left side column, "Determining Magnitude and Orientation of Least Principal Stress").

**As per Claim 13:**



Sollman discloses the method according to claim 12, further comprising the step of decreasing the number of fractures in response to the real-time fracturing data (page 969, middle column, lines 6-23).

**As per Claim 14:**

Sollman discloses the method according to claim 12, further comprising the step of increasing the distance between the fractures in response to the real-time fracturing data (page 970, under a title "Optimization of Horizontal Well Location" lines 1-3).

**As per Claim 15:**

Sollman discloses the method according to claim 12, further comprising the step of adjusting the size of the fractures in response to the real-time fracturing data (page 969 middle column, lines 15-23).

**As per Claim 16:**

Sollman discloses the method according to claim 1, wherein the subterranean formation comprises a well bore comprising a generally vertical portion (page 967, right side column, lines 36-40; Fig. 2).

**As per Claim 17:**

Sollman discloses the method according to claim 16, wherein the well bore further comprises one or more laterals (Fig. 2).

**As per Claims 18 and 24:**

The limitations of claims 18 and 24 have already been discussed in the rejection of Claim 1. They are therefore rejected under the same rationale.

**As per Claims 19 and 25:**

The limitations of claims 19 and 25 have been discussed in the rejection of Claim 2. They are therefore rejected under the same rationale.

**As per Claims 20 and 26:**

The limitations of claims 20 and 26 have already been discussed in the rejection of Claim 3. They are therefore rejected under the same rationale.

**As per Claims 21 and 27:**

The limitations of claims 21 and 27 have already been discussed in the rejection of Claim 6. It is therefore rejected under the same rationale.

**As per Claim 22 and 28:**

The limitations of claims 22 and 28 have already been discussed in the rejection of Claim 7. They are therefore rejected under the same rationale.

**As per Claim 23 and 29:**

The limitations of claims 23 and 29 have already been discussed in the rejection of Claim 12. They are therefore rejected under the same rationale.

**Conclusion**

12. Claims 1-29 are rejected.
13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

*US Patent No. 6,598,481 issued to Schultz et al.*

*US Patent No. 4,836,280 issued to Soliman et al.*

*US Patent No. 7,062,420 issued to Poe et al.*

*US Patent No. 5,463,164 issued to Perkins.*

*US Patent no. 7,043,410 issued to Malthe-Sorensen et al.*

*H.H. Abass, S. Hedayati, and D.L. Meadows, "Nonplanar Fracture Propagation From a Horizontal Wellbore: Experimental Study", SPE Production and Facilities , August 1996.*

14. Any inquiring concerning this communication or earlier communication from the examiner should be directed to Kibrom K. Gebresilassie whose telephone number is (571) 272-8571. The examiner can normally be reached on Monday-Friday, 8:30 am to 4:30 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner supervisor, Kamini shah can be reached at (571) 272-2279. The official fax number is (571) 273-8300. Any inquiring of a general nature relating to the status of this application should be directed to the group receptionist whose telephone number is (571) 272-3700.

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Simulation and Emulation, Art Unit 2128

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